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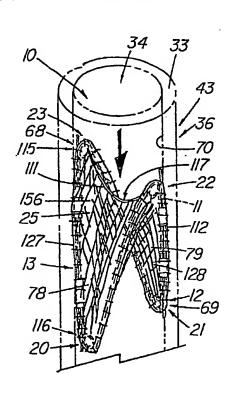
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[Continued on next page]

(54) Title: IMPLANTABLE VASCULAR DEVICE



(57) Abstract: A multiple-sided medical device (10) comprises a frame (11) comprising wire or other resilient material and having a series of bends (12) and interconnecting sides. The device is pushed from a delivery catheter into the lumen of a duct or vessel and may include one or more barbs (16) for anchoring purposes. A full or partial covering (45) of fabric or other flexible material such as DACRON, PTFE, or a collagen-based material such as small intestinal submucosa (SIS), may be sutured or attached to the frame to form an occlusion device (51), a stent graft (75), or an implantable, intraluminal valve (43) such as for correcting incompetent veins in the lower legs and feet.





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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A61F2/24 A61B A61F2/06 A61B17/12 According to International Patent Classification (IPC) or to both national classification and IPC **B. FIELDS SEARCHED** Minimum documentation searched (classification system followed by classification symbols) IPC 7 A61F Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal C. DOCUMENTS CONSIDERED TO BE RELEVANT Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No. L,X WO 99 62431 A (COOK INC) 1-11 9 December 1999 (1999-12-09) the whole document EP 0 856 300 A (VENPRO CORP) X 1-6,85 August 1998 (1998-08-05) the whole document Α 9-11 EP 0 667 133 A (CAMILLI SANTE) X 1-4,7,816 August 1995 (1995-08-16) column 4, line 22 -column 8, line 4; figures Α 9-11 WO 93 13712 A (UNIV MINNESOTA) X 9-11 22 July 1993 (1993-07-22) figures Further documents are tisted in the continuation of box C. X Patent family members are listed in annex. ° Special categories of cited documents: "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the *A* document defining the general state of the lart which is not considered to be of particular relevance invention *E* earlier document but published on or after the international "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to filing date document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such docu-"O" document referring to an oral disclosure, use, exhibition or ments, such combination being obvious to a person skilled other means in the art. document published prior to the international filing date but later than the priority date claimed *&* document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 15 November 2001 21/11/2001 Name and mailing address of the ISA Authorized officer European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rījswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo ni, Fax: (+31–70) 340–3016 Neumann, E

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Intr 'ional Application No
PCT/US 01/03766

		101/03/01/03/00		
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT			
Category "	Citation of docurnent, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	EP 0 920 842 A (KARPENKO VLADIMIR LEONIDOVICH ;KRUCHININ BORIS PETROVICH (RU)) 9 June 1999 (1999-06-09) abstract; figures	9-11		
Α	abstract, rigures	1,8		
A	US 4 994 077 A (DOBBEN RICHARD L) 19 February 1991 (1991-02-19) column 2, line 28 - line 54; figures	1-3,7,9		

1

INTERNATIONAL SEARCH REPORT

.nformation on patent family members

Inte 'lonal Application No
PCT/US 01/03766

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 9962431	Α	09-12-1999	AU	4412799 A		20-12-1999
			EP	1087727 A		04-04-2001
			WO	9962431 A		09-12-1999
			ÜS	6200336 B		13-03-2001
			US	2001011187 A		02-08-2001
EP 0856300		05-08-1998	NL	1004827 C	2	19-06-1998
			EP	0856300 A	1	05-08-1998
			US	6287334 B	1	11-09-2001
EP 0667133	A	16-08-1995	EP	0667133 A		16-08-1995
			ΑT	199490 T		15-03-2001
			DE	69330003 DI	1	12-04-2001
			DE	69330003 Ta	2	04-10-2001
			ES	2157918 T	3	01-09-2001
			US	5607465 A		04-03-1997
WO 9313712	Α	22-07-1993	CA	2128338 A	1	22-07-1993
			DE	69324239 DI		06-05-1999
•			DE	69324239 Ta		04-11-1999
			EP	0623003 A		09-11-1994
		•	EP	0876793 A2		11-11-1998
			ES	2133382 T	3	16-09-1999
			JP	7502918 T		30-03-1995
			US	5334217 A		02-08-1994
			WO	9313712 A	1	22-07-1993
			US	6077281 A		20-06-2000
			US	5578045 A		26-11-1996
			US	6077291 A		20-06-2000
EP 0920842	Α	09-06-1999	RU	2108070 CI	1	10-04-1998
			AU	3364897 A		02-02-1998
			EP	0920842 A1		09-06-1999
			US	6036716 A		14-03-2000
			WO	9801086 A	1	15-01-1998
US 4994077	Α	19-02-1991	NONE			